

CONSOLIDATED INFORMATION TECHNOLOGY SERVICES TASK ASSIGNMENT (TA)

1. **TITLE:** (B702) IMB Database Administration

TA No:	SLB018-Rev7	
Task Area Monitor:	Alternate Task Area Monitor:	
NASA POC:	Software Control Class:	Low Control
Type of Task:	Recurring Task	

2. **BACKGROUND**

The Information Management Branch (IMB) is responsible for providing and managing software, tools and administration of database systems and for supporting NASA and the NASA Langley Research Center (LaRC) community requirements and initiatives. Presently IMB supports Oracle and MySQL.

3. **OBJECTIVE**

The objective of this task is to effectively administer the database environment for the LaRC community and the Agency. This shall include: configuring, managing, and optimizing the database environments per Exhibit A.

Database Administration shall include but shall not be limited to:

- Backup and Recovery
- Performance Monitoring and Tuning
- Database Design and Modeling
- Data Security
- Stored Procedure Development (PL/SQL)
- Installation of Database Software and Tools
- Monitoring and Configuring Database Engine and Tools
- Documentation
- Customer Service

4. GENERAL IT SUPPORT SERVICES

Services Specified Through Exhibit A:

Services Specified Through Exhibit A:

Database Administration and Database Security Administration are required, and a complete listing is available in paragraph 4.6 of the ConITS Statement of Work.

Customer Support and IT Consultation and Training:

The DB support staff shall provide consultation and assistance on basic use of database services. Any support outside of normal support described in this task will be directly charged to the requestor.

DB support staff shall provide at no cost to the customer an estimate of the hours required to complete the task.

DB support shall provide MySql and Oracle customer support

The DB support staff shall interface with System Administrators, System Security Administrators, DB administrators, and Application Developers to create an efficient environment for all DB applications and all other applications, as well as to set up efficient and secure data calls and data structures.

The DB support staff shall provide an efficient mechanism for communication between the customer and IT/DB support staff via the Change Request System (CRS). The DB support staff shall provide prompt response (within 4 hours) to user problems. The 4 hours shall be during working hours (Monday to Friday, excluding Federal Holidays, 6 a.m. to 6 p.m.) and will begin at the moment the contractor receives notification of the problem.

Performance Metrics:

Exceeds: corrects issue within one hour

Meets: corrects issue within four hours

Fails: corrects issue later than four hours, or no response

Exceptions and Additional Requirements:

The Information Management Branch provides NASA and the Langley Research Center database and application server services utilizing a heterogeneous network of Unix, Linux, Solaris, Windows, and Mac servers. IMB currently provides support for Oracle and MySQL databases. As part of the Center's Information Technology Service Pool, the services and products provided are described in detail below.

Customer Support:

Provides a communication mechanism between customer and IT support staff via CRS.

Provides prompt response (within four (4) hours) to user problems

Provides current status of problems and the resolution to the users

Interfaces with system administrators, system security administrators, database administrators and application administrators as necessary to resolve customer issues

Database Software Administration:

Installs and maintains new and upgraded DBMS software and associated tools on test, development, and production systems with approval of TAM

Identifies impacts of new and upgraded software by testing, documenting and communicating the potential impacts to the customers before implementation

Maintains a functional DBMS environment:

1. Monitor database statistics and adjust memory and processes.
2. Monitor and adjust tablespace requirements.
3. Monitor database instance processes and alert logs. Take prompt and appropriate actions to provide high availability of database.

Maintains and documents a common or standard configuration for the DBMS environments to enable application developers to efficiently migrate applications and to produce predictable results.

Monitoring and Configuring Database Engines and Tools:

Monitors the activity of the database engines to determine efficiency of the database engines and applications. Manages disk space allocations, performs consistency checking, and monitors recovery logs.

Recommends improvements to system and database for configuration management and informs the TAM of potential changes.

Based on the configuration of the file servers and the database workloads (existing and projected), configures and tunes the database engines as necessary to optimize performance of database applications, while minimizing effects on the rest of the file server workloads.

Analyzes the database workloads and storage needs, and plans for growth of databases. Makes determinations of DBMS software to support these needs, and communicates, develops and maintains a 3 year plan for growth for hardware and software requirements to system administrators and TAM.

Monitors and maintains the use of the licenses for the database engines and related tools.

Provides solutions for allowing connections to the database engines from other platforms. These solutions will include the use of Open Database Connectivity (ODBC) and database client tools:

1. Coldfusion application connectivity to the database using native drivers.
2. Coldfusion application connectivity to the database using Oracle thin drivers.
3. PERL DBI/DBD connectivity to MySQL and Oracle databases.

4. Oracle developer tool connectivity to the database.
5. Sql /isql/TOAD connectivity to the database.

Maintains and updates a web based interface to the Database Tracking Tool that compiles an ad hoc query capability.

Monitors databases and the systems housing the databases via a software monitoring system during normal business hours (Monday through Friday, excluding Federal Holidays, from 6 a.m. to 6 p.m., Eastern Time) and reports problems via email to designated contractor personnel who respond and initiate proper corrective action. It is the responsibility of the contractor to inform the NASA Responsible Official, the TAM, and Alternate TAM of the problem and begin to take corrective actions.

Maintaining Expertise and Providing Knowledge:

Reviews and recommends new technologies to the Technical Area Monitor upon request of the TAM.

Attends Biweekly Status Review, project, and management meetings.

Provides technical support, consulting and coordination to ensure orderly system implementation.

Integrates and operates all database systems, database systems software and database application software.

Performs studies analyzing new technologies, analyzing feasibility of technical approaches, defining user requirements, analyzing existing environments, identifying constraints, deriving and analyzing alternative solutions, recommending approaches and solutions, and estimating costs and benefits upon the request of the TAM.

Maintains efficient MySql and Oracle expertise.

Security Administration:

Maintains the security of databases by managing access, passwords and DBMS application-specific requirements to comply with NPR 2810.1.

Manages access privilege to tables, stored procedures and other areas of all databases.

Monitors, reviews, evaluates, and responds to security breaches discovered through web server logs, Internet reports, or security scans or other means (Within one hour of notification or discovery).

Researches and accomplishes Agency, Center, and Governmental certifications and required training.

Establishes, maintains, and removes userids and passwords according to the Center and Agency policies.

Attends monthly security briefings and reviews security bulletins, disseminates security

information, evaluates information disseminated, and provides impact analysis to Technical Area Monitor.

Researches and provides methods to avoid possible security risks.

Data Backup and Recovery Administration:

Archives and restores the database instances and logical logs and provides input into system disaster/recovery plans to help ensure accurate restoration of databases. Restores data as required. Provides a semi-annual report and documentation on Archival and Recovery Validation.

Performs periodic tests (at least every six months) to ensure that hardware, software and processes will function as required to support the archiving and restoring of data.

Establishes, maintains, manages, and reviews back up procedures and reports as scheduled.

Provides a schedule for testing the backup and the archive recovery plan. Ensures that testing for the backup and archive recovery will occur once a year and provides the results to the TAM.

Documentation:

1) Fully documents, maintains and delivers documentation to TAM in a controlled environment according to the Agency Configuration Management standards for the following:

-- Configuration of the database environments including site-specific parameters; operational procedures in the administration of the database environments.

-- Archival and restoration strategic plan

2) Creates, researches, evaluates, and prepares in final format Monthly Technical Status Reports, white papers, incident reports and security breaches.

-- Creates and maintains a change management document in order to provide recommendations to increase efficiency and productivity of the supported systems

Reporting:

1) Reports database activities and use on an as-needed basis

2) Informs TAM of licensing updates and renewals (at the request of the TAM)

3) Provides semi-annual reports on archival recovery validation

4) Report Status of database engine and tools to determine performance within in 1 day of being requested by TAM.

Resolution of Problems/Issues:

Provides troubleshooting skills to identify and resolve problems/issues related to the database instance or other related tools. Documents these problems/issues, resolutions, and lessons learned and reports them to the TAM/Alternate TAM on at least a monthly basis.

Interfaces with system administrators, system security administrators, database

administrators and application administrators to develop solutions to problems and to implement corrective action.

Environment Optimization:

Provides technical support, guidance and implementation to ensure that the DBMS environment is maintained in an optimized configuration.

This may include, but not be limited to:

Assisting customers and developers in identifying DBMS system limitations/issues that could potentially result in system performance degradation, and providing recommendations to resolve suspect limitations/issues along with an estimate of costs, benefits, impact statement and schedule.

Performing studies analyzes DBMS environment performance and, at a minimum, monitoring and tracking performance, as well as submitting performance metrics and issues to management in monthly reports along with proposed/implemented resolutions.

Providing technical support and consultation to ensure expedient resolution of DBMS environmental performance issues as they arise

End of Life Database Management:

Upon the request of the TAM, archives and manages a library of removed database schemas; creates a Process/Data Flow Diagram.

Removes database schemas as requested by the customer and Technical Area Monitor.

General IT Support Services Performance Metrics

Performance Standard: The systems to which these services apply are kept up to date with minimum disruption in capability due to upgrades. Minimum disruption is defined as an inoperable server for more than six (6) business hours.

Performance Metrics:

- Exceeds: All notifications of updates or upgrades are acted upon and all approved upgrades are installed on schedule and without disruption; or "meets" and improvements to systems are recommended and adopted. Databases and systems are restored within 3 business hours of disruption.
- Meets: All notifications of updates or upgrades are acted upon. All approved upgrades are installed with minor delays and disruptions. Databases and systems are restored within 6 business hours of disruption.
- Fails: Any of the requirements of this section are not satisfied. Databases and systems are restored more than 6 business hours after disruption.

Performance Standard: Database Tracking Tool (Exhibit D) is kept up-to-date and is available in a password protected web enabled database.

Performance Metrics:

- Exceeds: Tracking tool is kept up-to-date and is available in a password protected central electronic location and results are provided to TAM/Alternate TAM more frequently than once per week.
- Meets: Tracking tool is kept up-to-date and is available in a password protected central electronic location and results are provided to TAM/Alternate TAM once per week.
- Fails: Tracking tool is not up-to-date available in a password protected central electronic location and results are provided to TAM/Alternate TAM less frequently than once per week.

Performance Standard: Response to requests for help is given within 2 hours. Customer requests are tracked and appropriate expert advice is sought when needed. Appropriate and correct advice is given to customer.

Performance Metrics:

- Exceeds: Response to requests for help is within 1 hour. Customer requests are tracked and appropriate expert advice is given. Customer rates service as very good to excellent.
- Meets: Response to requests for help is given within 4 hours. Customer requests are tracked and appropriate expert advice is sought when needed. Customers rate service as satisfactory or better.
- Fails: Response to requests are given after 4 hours. Customers rate service as unsatisfactory.

Performance Standard: Archiving schedules are met and data and systems are ready to restore databases on short notice.

Performance Metrics:

- Exceeds: Archiving schedules are done as described in the archive schedule. Data is restored within 4 business hours. Data restored is 100% accurate and available to the customer. Semi-annually disaster recovery tests are held and initiated by the Contractor and confirm readiness for disaster recovery.
- Meets: Archiving schedules are met. Data is restored within 6 business hours. Data restored is 100% accurate and available to the customer. Annual disaster recovery tests are held and initiated by the Contractor and confirm readiness for disaster recovery.
- Fails: Archiving schedules are not adhered to as described. Data is restored after 8 business hours. Data restored is less than 100% accurate and available to the customer. Data is not available to the customer. No disaster recovery schedules are held or TAM/Alternate TAM must direct disaster recovery tests to be completed.

Performance Standard: Database engines and tools are tuned for optimum performance.

Performance Metrics:

- Exceeds: Contractor initiates recommendations for database optimum performance. Daily tuning of databases and systems is performed to ensure optimization. Recommendations are implemented and significant improvements are realized.

- Meets: Contractor researches and makes recommendations for optimum database performance. Recommendations are approved and implemented, and significant improvements are realized.
- Fails: Contractor does not recommend options for database optimum performance. Recommendations are not approved and implemented, and significant improvements are not realized.

Performance Standard: Documentation is complete, understandable, and update to date including, but not limited to, reporting on the attached exhibits; system and database configuration information, and database tracking tool.

Performance Metrics:

- Exceeds: Documentation is error free, complete and up-to-date. Significant improvements have been made in the clarity of documentation or documentation is proactively sought from all sources. Documentation is complete, final, and delivered to TAM/Alternate TAM 5 business days prior to deadline.
- Meets: Documentation is complete with only minor errors noted. Documentation is complete, final, and delivered to TAM/Alternate TAM on date of deadline.
- Fails: One or more required documentation components are not available. Documentation is complete, final, and delivered to TAM/Alternate TAM three or more days after date of deadline.

Performance Standard: The security of systems and data that fall under this task is ensured.

Performance Metrics:

- Exceeds: The system meets IT security requirements for an information category more stringently than expected; there are no unpatched vulnerabilities, unless the vulnerability has been mitigated by other action, accepted by line management and approved by the LaRC IT Security Manager; user accounts are removed by the close of business of the day that the requirement for an account is terminated; any IT Security incidents are reported to the LaRC IT Security Manager and the NASA Technical Monitor within 30 minutes of the incident.
- Meets: All baseline IT security requirements for the information category are either met or have a waiver for non-compliance from the LaRC IT Security Manager; the system is up-to-date with security patches or has scheduled the installation of such patches at the completion of a test that precludes immediate installation; user accounts are removed within one week of the termination of the requirement for an account; any IT Security incidents are reported to the LaRC.
- Fails: The system does not comply with the baseline IT security requirements for the information category and does not have a waiver for non-compliance from the LaRC IT Security Manager; the system is not up-to-date with IT security patches; user accounts, for which the requirement was terminated, have not been removed after a period of two weeks; the system has an IT security incident that is not reported to the LaRC IT Security Manager and the NASA Technical Monitor.

Performance Standard: Recommends cost saving approaches for database and application

management activities.

Performance Metrics:

- Exceeds: Contractor recommends and ensures that all task activities costs are below the budgeted hours or below what was budgeted for the year.
- Meets: Contractor recommends and keeps task activities costs within the budgeted hours or within what was budgeted for the year.
- Fails: Contractor does not recommend ways to keep the task activities costs low and the tasks cost are above the budgeted hours or above what was budgeted for the year.

Performance Standard: The databases and systems to which these services apply operate efficiently and with minimal disruption in capability due to malfunctions.

Performance Metrics:

- Exceeds: Successful and rapid recovery from a malfunction or disaster has been accomplished and completed within three hours of malfunction. Degradation of capability due to malfunctions has been significantly mitigated by system and database administrator actions. All data is restored and is available to customer.
- Meets: Successful and rapid recovery from a malfunction or disaster has been accomplished and completed within 6 hours of malfunction. Degradation of capability due to malfunctions has been mitigated by system and database administrator actions. Ninety-five percent of data is restored and available to customer.
- Fails: Successful and rapid recovery from a malfunction or disaster has been accomplished and completed with ten hours of malfunction. Degradation of capability due to malfunctions has not been significantly mitigated by system and database administrator actions. No data is restored and available to customer.

Performance Standard: Deliverables are made on schedule; and meet project requirements and acceptance criteria.

Performance Metrics:

- Exceeds: All deliveries are made ahead of schedule. The system, database, or application meets the task requirements without exception. No anomalies are found during testing.
- Meets: Deliveries are made on schedule. Any delays in delivery are minor and are made up within the overall schedule. Only minor deficiencies are found that are readily correctable within the development schedule.
- Fails: Deliveries are late. The overall schedule has slipped by more than 2 weeks. Deficiencies are found that will result in significant delays to correct.

Performance Standard: Database software is fully operational and up-to-date on both production and development systems.

Performance Metrics:

- Exceeds: Software configurations and versions are kept in sync between development, SAT and production. Systems are not out of sync for more

than 5 business days.

Meets: Software configurations and versions are kept in sync between development, SAT and production. Systems are not out of sync for more than 10 business days.

Fails: Software configurations impact the functioning of the server and applications housed on them and the development, SAT and production systems are out of sync for more than 10 business days.

Performance Standard: Security of databases and instances is ensured.

Performance Metrics:

Exceeds: Weekly audits of logs are held to identify potential security breeches and reported to the TAM/Alternate TAM with recommendations for improvements. Users are removed or added with proper access within 4 business hours of request.

Meets: Weekly audits of logs are held to identify potential security breeches and reported to the TAM/Alternate TAM with recommendations for improvements. Users are removed or added with proper access within 8 business hours of request.

Fails: Audits are not conducted or reported to the TAM/Alternate TAM. Users are removed or added with proper access after 8 business hours of request.

Performance Standard: Any problems that occur are resolved and corrected. Problem solution progress is tracked and documented.

Performance Metrics:

Exceeds: The Contractor identifies problems, resolves and corrects them, and reports the symptoms, problem, cause, and solution to the TAM/Alternate TAM within 2 business hours of incident.

Meets: The Contractor identifies problems, resolves and corrects them, and reports the symptoms, problem, cause, and solution to the TAM/Alternate TAM within 4 business hours of incident.

Fails: The customer, TAM/Alternate TAM, or end user identifies problems. The contractor resolves and corrects them, and reports the symptoms, problem, cause, and solution to the TAM/Alternate TAM within 8 business hours of incident.

Performance Standard: Inventory of equipment and software is up-to-date and accurate.

Performance Metrics:

Exceeds: Contractor takes the initiative and updates the Database Tracking Tool Exhibit D prior to reporting to the TAM/Alternate TAM. Exhibit D is 99 percent accurate and updated as requested by TAM/Alternate TAM more than twice a year.

Meets: TAM/Alternate TAM tasks the contractor to update the database-tracking tool. Database Tracking Tool Exhibit D is 90 percent accurate. Exhibit D is updated as requested by TAM/Alternate TAM no more than twice a year.

Fails: Inventory is not up-to-date. More than 20 percent of the information

provided is inaccurate. Database Tracking Tool Exhibit D is updated by TAM/Alternate TAM once a year.

Performance Standard: The Contractor monitors Database Environment and Support Staff notifies LaRC Manager of problem and resolution via email. Contractor creates data entry into Configuration Management System and monthly reporting.

Performance Metrics:

- Exceeds: Delivery exceeds business hour schedule with proactive solutions, data entry into Configuration Management System is thorough and monthly report contains entry as well as solutions and future concerns.
- Meets: Delivery is met with no or only minor omissions. Data entry is made to Configuration Management System and an entry is made in monthly reporting.
- Fails: Late Delivery or notification or no notification at all, with no entry into Configuration Management System and/or no entry into monthly reporting.

5. SYSTEM AND APPLICATION DEVELOPMENT SERVICES

None required.

6. WORK-AREA SPECIFIC SERVICES

Work Area Title: Database Monitoring

LaRC Manager:

Work Area Description: Database Systems housed on equipment listed within Exhibit A shall be monitored via a software monitoring system during normal business hours (Monday through Friday, excluding Federal Holidays, from 6 a.m. to 6 p.m., Eastern Time).

Work Area Requirements: For each database environment or application, contractor support staff shall inform, via email, the NASA line manager, the TAM, and alternate TAM of any disruption of service within 4 business hours after the event. Contractor to provide a follow-up email when the problem is resolved and a detailed description of the problem resolution. Contractor shall document the occurrence and create a configuration management entry as well as report this in the monthly reporting.

Work Area Title: Data Archive Support

LaRC Manager:

Work Area Description: The contractor shall place archived databases under configuration management.

Work Area Requirements: The contractor shall maintain an accurate library of archived web sites and applications.

Performance Standard: The contractor shall maintain an accurate library of archived web sites and applications.

Performance Metrics:

Exceeds:-The list of archived sites is 100% accurate and available real-time.

Meets:-The list of archived sites is 90 - 99% accurate and available real-time.

Fails:-The list of archived sites less than 90% accurate and available real-time.

Work Area Title: Database Administration support for the Langley Document Management System (NX/CPX):

LaRC Manager:

Work Area Description: The database administration for the Langley Document Management System (NX/CPX) involves administering Oracle databases which contain the application metadata. Work performed on these databases should be done with the concurrence of the Work Area Manager.

Work Area Requirements: The Langley Document Management Systems Oracle databases will be fully supported under task SLB018 and tracked under a unique subtask. Creation and maintenance of NX/CPX instances will include:

- 1) If a new instance is required, establish database on designated server using database schema provided.
- 2) Maintenance of existing Oracle databases should include optimization and periodic testing of backup and recovery procedures.
- 3) Oracle patches and upgrades should be performed with concurrence of Work Area Manager.
- 4) Active monitoring and potential restoration during NX/CPX upgrades.

7. Exhibit A

[Exhibit A](#)

[Exhibit A](#)

8. SPECIAL SECURITY REQUIREMENTS

None required.

9. SOFTWARE ENGINEERING PROCESS REQUIREMENTS

None required.

10. JOINT REVIEW SCHEDULE

A Joint Review shall occur twice a month. Other meetings may be called at the request of the TAM. The TAM and the Contractor Task Lead shall determine the time and length of the meeting. The following persons or their alternates are required to attend: NASA Technical Monitor and Contractor personnel assigned to task and working on agenda items being discussed. Technical performance, timeliness, cost, project status, challenges, and staffing will be discussed. The Contractor will maintain minutes; minutes from each meeting will be emailed to participants within two business days for review and correction where necessary.

11. PERIOD OF PERFORMANCE

This TA is effective from 02/01/02 to 04/27/10

12. TECHNICAL PERFORMANCE RATING

In evaluating Technical Performance, quality and timeliness shall be rated as follows:

Quality: 70% Timeliness: 30%

13. RESPONSE REQUIREMENTS

This Task Plan shall address the contractor's specific work plans, estimated labor hours, cost and schedule.

14. FUNDING INFORMATION

Funding has not been entered for this TA.

15. MILESTONES

None required.

16. DELIVERABLES

Number	Deliverable Item	Deliverable Schedule
1	Joint Review Meeting	Every two weeks at the request of TAM.
2	Review of Contingency Plan Validation	At the request of TAM.
3	Reports of Quarterly Archive/Recovery validation	At the request of TAM.
4	Maintain an up-to-date real-time web enabled database for MySQL and Oracle development and production database information.	2/28/08
5	Use the Center for Internet Security Benchmark (CIS) database scoring tool to review all appropriate database installations and report findings.	At the request of TAM.
6	Upgrade Schedules/Reviews, Recommendations, and Plan	At the request of TAM.
7	Research/Test a MySQL Clustering environment	3/1/08
8	Transition all Oracle backups to use Oracle Recovery Manager (RMAN)	3/03/08
9	Install/Test Oracle 11g and evaluate features and performance.	05/31/08

10	Test/Migrate an Oracle database using a MySql migration tool to a MySql database and report the migration process.	04/01/08
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17. FILE ATTACHMENTS

[Others1](#)